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TECHNOLOGY DEPT. SEPTEMBER 30, 1950

SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE

Synthetic Sun

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A SCIENCE SERVICE PUBLICATION

\$3.50 A YEAR

VOL. 58 NO. 14 PAGES 207-224

MEDICINE

Blood Safety Questioned

Cases of jaundice, believed traceable to virus in blood plasma, are reported, but health and medical authorities are satisfied irradiation is effective when properly done.

► THE SAFETY of human blood plasma that has been treated with ultraviolet light to destroy possible jaundice virus in it is questioned by three groups of doctors reporting in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Sept. 16).

Eighteen cases of this kind of jaundice, known medically as homologous serum hepatitis, are reported. In all cases, the doctors reporting believe the sickness was due to virus in the plasma given the patients for other illnesses.

But, says an editorial in the same issue of the A. M. A. Journal, "physicians should not withhold blood or plasma from any patient because of these adverse reports; however their indiscriminate use should be discouraged."

Discovery that the virus of this hepatitis could be inactivated in blood serum by ultraviolet irradiation and that the plasma was not otherwise affected led to adoption of ultraviolet irradiation as the official method of sterilizing plasma. During the two years since then, the Journal editorial points out, only a few sporadic cases of hepatitis have been reported following extensive use of irradiated plasma.

Officials at the National Institute of Health in Washington state they are satisfied that irradiation, properly done, is effective for sterilizing plasma and that they will continue to require it for all blood products for the armed forces and civilian use.

Hepatitis, meaning inflammation of the liver, may come from various causes. In this particular condition it is caused by a virus. The yellowing of skin and whites of the eyes known as jaundice is a symptom of this and of other liver diseases.

Not all persons have this virus in their blood. There is no laboratory test for the virus in blood, and no laboratory animal is susceptible to it. Scientists at the U. S. National Institute of Health have even tried silkworms in the hope of finding a laboratory animal that could be used to test human blood for this virus. The silkworms, however, did not prove susceptible to the virus.

Processors of plasma, the A. M. A. Journal advises, should screen blood donors carefully, eliminating those with a history of suspicious illness or contact with hepatitis. Equipment for irradiating the plasma should be continuously checked for efficiency. Needles and equipment used for collecting blood must be sterilized by autoclaving or boiling. Users of plasma, in hospitals or private practice, should be

equally careful about the sterility of all materials used to puncture the skin or to collect blood. Needles used in giving the plasma might be a source of the virus if not sterilized.

A more direct test for the virus-killing effect of ultraviolet irradiation should be sought, the medical journal also points out. At present a sample of plasma that has been irradiated is seeded with a test bacillus and again irradiated. If the test organism has been destroyed, this is considered proof of the efficiency of the irradiation sterilization.

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EDUCATION

Hollywood Tricks Do Not Aid Film Learning

► HOLLYWOOD tricks to capture attention in instruction films do not help learning. They may interfere with it.

Two groups of 1,055 naval trainees and 1,576 army recruits saw one of five versions of a training film on use of machine-shop measuring tools or they saw no film at all. All were later given an information test on the film's content.

Results of the test were reported in State College, Pa., to the American Psychological Association by Dr. D. Morgan Neu of Pennsylvania State College.

The group that saw no film at all got lower scores than those who saw the film. The version with no attention-getting devices was as effective if not more so than the jazzed up versions. The versions containing irrelevant visual material or irrelevant sound may have interfered with learning.

Devices like ultra close-ups, spot-lighting, and pointing do not necessarily help learning, it was found.

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ENGINEERING

Grinding Tough Materials Easy with Liquid Nitrogen

► THE TOUGHEST materials can be ground to a powder by a process which utilizes liquid nitrogen developed by the Linde Air Products Company of New York.

The function of the liquid nitrogen, which is used in spray form, is to cool the material to be pulverized to a point of maximum fragility. The new process can be used to pulverize rapidly mechanically-

tough or heat-sensitive materials such as plastics, pharmaceuticals, insecticides, food stuffs, substances containing vitamins and other organic materials.

In operation, liquid nitrogen is injected into a chamber between the feed hopper and a high-speed stainless steel pulverizing mill. The fine liquid nitrogen spray plays on the material passing through, cooling it to a low temperature.

It has not been found necessary as yet to cool materials to the temperature of liquid nitrogen, approximately 320 degrees below zero Fahrenheit. One great advantage in using liquid nitrogen instead of some other liquefied gas is that nitrogen is an inert element and does not react chemically with materials being ground.

At the present time, liquid nitrogen grinding is limited to high-cost materials that are able to absorb the added grinding cost. An important use will be in grinding materials that might be changed in one way or another by the heat generated by high-speed grinding.

Materials with low melting points, as an example, normally overheat and prevent continuous grinding, or sometimes the grinding results in torn rather than sharply defined particles. The inert nitrogen atmosphere will be of aid in grinding explosives and oxidizable materials. A low temperature mill will prevent loss of aromatics and volatiles.

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GENERAL SCIENCE

Corporation Reports Understood by 1 out of 4

► THE ANNUAL reports of billion dollar corporations cannot be understood by 75 out of 100 American adults.

This was the report of Drs. Siroon Pashalian and William J. E. Crissy, of New York University and Queens College in New York, based on a study of the readability of samples taken from 26 such reports.

On the whole, they found, the general level of reading is difficult. The human interest value is "dull."

One difficulty was in the use of large numbers of figures. When from 10 to 20 figures appear in a single 100-word sample of text, the author should take warning and think about putting them in a table or chart, the investigators suggest.

Corporation reports should pay more attention to individual personalities, the investigators urge.

"People are interested in people," they conclude. "They want to become better acquainted with the outstanding personalities of the corporation. Yet, among the 21,100 words sampled in this study only 20 names were mentioned."

Personalities were largely confined to obituaries.

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PSYCHOLOGY

Armed Forces Test Valid

The armed forces qualification test, criticized as being too difficult, tests what it is designed to test. The men simply are not qualified.

► THE ARMED forces qualification test jumped on by Maj. Gen. Lewis B. Hershey, head of Selective Service, as flunking too many men, is doing just what it is designed to do, Army records indicate.

This test is designed to keep out of the Army those men who are so stupid or ignorant that they would do the Army more harm than the enemy itself. Difficulty of the test was planned so as to disqualify 13% of men of draft age. It is just that proportion of the population that is too low in intelligence or education to make good soldiers, Army figures indicate.

Actual rejections during the month of July for failure on the mental test amounted to 15.2%, a figure slightly higher than the expected 13%. But the drafted men sent to the Army were not representative of the whole population. Screened out were all those who had enlisted in the Navy or Air Force, all veterans, all college boys who were in the upper 50% of their classes, and all R. O. T. C. students.

Passing mark on the test was not set by the Army; it was set by Congress in the Selective Service Act of 1948, where it is provided that the Army should accept all men who make a score better than 70 on the old Army General Classification Test.

By giving the new all-services test to 12,000 men who had also taken the old GCT, an equivalent on the new test for the grade of 70 on the old one was found. This is the new cutting point.

The new test, which has been in use since Jan. 1 of this year, is the answer to a demand that all the armed forces have one single scale for measuring the talents of their men. It was prepared by experts from the personnel research section of the Army and from equivalent offices in the Navy, Air Force, Marine Corps and Coast Guard. Practically all the experts who worked on the test had seen service during World War II; the rest had been civilian employees of the Armed Forces during the war.

The test is designed to measure native intelligence, that is, the ability to learn what a soldier needs to know, and also ability to read simple instructions.

Care was taken to make the instructions in the test clear and simple to understand. Every word used was looked up on the famous Thorndike list of word difficulty, and no word was included that was above fourth grade difficulty.

Three kinds of questions are included in

the test. One kind is arithmetic reasoning, none of the questions beyond eighth grade in difficulty. Some questions test knowledge of words. And then there are questions that measure ability to sense spatial relations. This is measured, for example, when a drawing shows the surface of a construction of irregular form built of blocks. The candidate is asked to count how many blocks were used to build the form. Ability to do this has been found to be a good index to ability in certain occupations such as that of automobile mechanic.

Before being used in the test, every single question was first tried out in recruiting offices throughout the country to find out

its difficulty. Trials were made on two and a half times as many questions as were actually used. Those selected were found to distinguish best between good soldiers and poor soldiers.

The test as a whole was then tried out on 12,000 men who were representative of all the armed services in the last year of the war.

Whenever a man fails the mental test, he is immediately checked up on to see whether or not he is goldbricking. His work record and history of schooling, as provided by his own draft board, are examined. If it is found, for example, that he has graduated from high school, he is in the Army regardless of his score on the test. Less than one high school graduate out of a hundred should fail this test. Also if he has held a good job, that is considered as evidence that he is not deficient in intelligence, no matter what his test score.

If, however, he has a history of never being able to hold a job or to stay in school, that is considered to indicate that he would not be a good man in the Army.

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MEDICINE

Two Medical Firsts

► TWO medical firsts are reported from the Naval Medical Center at Bethesda, Md.

A mental patient who choked himself to death was one of the firsts reported by Drs. Morton J. Aronson and Samuel V. Thomp-

son, of the Neuropsychiatric Section.

The other was a patient saved from death after his temperature had gone up to 106 degrees in a state of acute excitement. Extremely high temperatures are not unusual



ANTI-SUBS—The ZPN airship, newly developed for the U. S. Navy, will help to combat the submarine menace in the event of future war. The net, shrouding the huge ship, is used to hold the helium-filled envelope down while the control car and other fixtures are being attached.

in patients in catatonic excitement, when the temperature mounts rapidly and in a few minutes may go as high as 110 degrees. These cases usually die.

This patient was saved by rapid action on the part of the physicians. In addition to treatment with antibiotics, barbiturates and large doses of vitamins, he was given adrenal cortical extract. Practically continuous alcohol sponge baths were given him. Electric shock treatment was tried.

Gradually the temperature went down, the excitement subsided and blood pressure and chemistry returned to normal. The patient recovered with no memory of what he had been through.

The other patient, after repeated suicide threats, suddenly went wild on his birthday and threw himself about his room. He had to be restrained from mutilating himself. Then he stuck out his tongue and clamped his teeth down on it and held his breath. During one such spell of breath holding, his heart stopped beating.

Artificial respiration and injection of stimulants failed to restore him. He was dead.

The physicians' full report on these two patients is contained in the current *AMERICAN JOURNAL OF PSYCHIATRY* (Sept.).

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AERONAUTICS

Plane Wings without Rivets From New Forging Process

► **RIVET-LESS** wings for airplanes, constructed by a new forging process that saves cost, time and metal in the manufacture of wing panels, were revealed in Dayton, Ohio, at the Wright-Patterson Air Force Base.

The process was developed by the Air Materiel Command's Industrial Planning Division, the Lockheed Aircraft Corporation, Burbank, Calif., and the Wyman-

Gordon Company, Worcester, Mass. It utilizes specially designed dies and a vertical hydraulic press to forge one-eighth inch thick integrally-stiffened wing skins, thus eliminating the need for riveted reinforcements.

With present wings, there may be up to 15,000 rivets in a wing surface. Cost of both rivets and installation is wiped out by the new forging method. There is also a great saving in the amount of aluminum required for fabrication when it is machined out of solid stock. In the old process a large percentage of the aluminum ends up as trimmings and chips which must be returned to manufacturers for reuse.

The new rivetless panels are being manufactured in the plant of the Wyman-Gordon Company. A German scientist, Karl Braeuninger, assigned to the Air Force, is in charge of the project.

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AGRICULTURE

Giant Fruits Aid Plant Genetic Study

► **SCIENTISTS** at Geneva, N. Y., like nothing better than to open their mail and find apples the size of grapefruit or grapes which look like small plums.

As fall's harvest season approached, Dr. John Einset of the New York State Agricultural Experiment Station sent out a call for such giant fruit, or "sports" as they are called. If you find an elephantine apple or a king-sized grape, you can aid in a long-range study of uncommon plant genetics.

Send the fruit to the Geneva station for examination, and carefully mark the tree or vine where you found it. Describe the fruit briefly and give the name and address of the grower on the postcard to the experiment station.

True apple "sports" are often twice normal size, flatter and irregular in outline.

The tree on which they grow usually has thick twigs and a flat, bushy shape. Grape vines with unusual ambition sometimes turn out grapes twice the size of those on a neighboring vine. The reason is an unusual combination of the tiny bodies in the germ cells called chromosomes. These determine hereditary characteristics in plants and animals alike.

Science News Letter, September 30, 1950

SCIENCE NEWS LETTER

VOL. 38 SEPTEMBER 30, 1950 No. 14

44,600 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by **SCIENCE SERVICE, Inc.**, 1719 N St., N. W. Washington 6, D. C., NORTH 2255. Edited by **WATSON DAVIS**.

Subscription rates: 1 yr., \$5.50; 2 yrs., \$10.00; 3 yrs., \$14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 3440, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago, STate 4439.

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The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

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MEDICINE

Malady of Our Times

High blood pressure personalities are characteristic of the era in which we live. Such persons need to find their individuality and adjust in the best way to demands.

► THE HIGH blood pressure personality is "characteristic of our times," Dr. Robert Sterling Palmer of Massachusetts General Hospital, Boston, declares in a report to the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Sept. 23).

"Practicality, objectivity and adaptability" are the chief characteristics of high blood pressure personalities, he finds from a study of 50 patients. The study, he points out, was made by a physician specializing in internal medicine, not by a psychiatrist.

"Originality, special skills and even special interests are conspicuous by their absence," he reports.

The personality pattern he found in the 50 high blood pressure patients is not specific for high blood pressure. It is the "personality's protective coloring induced by the prevailing normal climate."

"Tension results when this outer coat does not fit the patient's inner disposition," he states.

This tension is not specific for high blood pressure, either, but "contributes importantly to the development of other diseases of civilization.

"The task is first to assist the patient in finding his own inner individuality and second, to adjust it as best he can to current demands. This cultural factor in the causation of the disease presents a problem, doubtless insurmountable in one or several generations. This is not a reason for failure either to state the problem or to attempt to do something about it."

Dr. Palmer worked out a technique for inducing strain in patients with high blood pressure. It consisted in having the patient leaf through a 45-page loose-leaf notebook. On the first pages of the notebook are given simple statements about heart disease, high blood pressure and the outlook for patients with this condition. On each of 20 pages is printed the statement of a painful life situation or event from the history of an actual patient with high blood pressure. Outlines of 11 brief case histories of patients, especially in their psychosomatic aspects, are then given.

The patient reads, comments and asks questions. The blood pressure is taken at one or two minute intervals. When a rise in blood pressure, a telltale change in ex-

pression or position or some comment shows that something in the booklet has struck home, the doctor and patient can discuss it. In this way the doctor and patient both learn what emotional disturbance may be causing the high blood pressure in this particular patient. From this, methods of relieving the stress and the anxiety about the high blood pressure may be worked out.

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ENGINEERING

Develop New Type Conveyor Belt for Industry

► U. S. STEEL rolled out a new type of industrial conveyor on which loads move automatically to dead center and stay there.

Invented by E. T. Lorig, chief engineer of Carnegie-Illinois Steel Corp., a U.S. Steel subsidiary, the conveyor is a pathway of steel rollers. On each axle are twin rolls, each tapered slightly from the center out, but tilted so their working surfaces form a straight line.

The net effect is a "toe-in" force toward the center of the conveyor. As an object moves along the rolls, friction centers it exactly. The engineers dubbed the principle "planar action." Conveyors based upon this principle are already at work in several U.S. Steel plants. The rolls are being manufactured by Carnegie-Illinois in Johnstown, Pa.

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ARCHAEOLOGY

Monks Slowly Rebuild Destroyed Monastery

► THE SOUND of the pick and shovel are familiar to any archaeologist. Those who have dug up ancient cities know the task of trying to assemble broken pots, cuneiform tablets, stone inscriptions, life-size marble statues or mosaics.

At Monte Cassino, of World War II fame, emerges a new romance to archaeology. On top of this mountain overlooking the plains across which American troops fought for merciless weeks, the sound of the stone hammers beats a tattoo. The monks are rebuilding their monastery according to ancient plan. Here lie thousands of fragments made by recent steel shells and explosives—all being restored like a giant mosaic.

In one corner of a courtyard a black-robed monk is assembling carved marble blocks according to his pen and ink sketch of the way they were before the bombs came.

The chapel was demolished by shell-fire, but the tomb containing the bones of the monks' patron, Saint Benoit, was unharmed. A dud landed three feet away; this has been left where it fell, its nose buried in the ground. A passer-by might



DEFIES GRAVITY—By a 20-degree uptilt of his circular conveyor model, E. T. Lorig defies the laws of gravity. Inventor of the self-centering roll, he demonstrates the strong centering action on objects of various sizes, shapes and weights. The conveyor consists of a nest of split conical rolls individually driven.

refer to this as a miracle.

In the local museum reconstruction drawings of sections of the Monastery by the monks have been framed. These are the working models.

As soon as hostilities ceased, the rebuilding of the Monastery at Monte Cassino be-

gan. Five years later considerable progress has been made, but it will require perhaps 20 years to complete the restoration.

Those who work on this project, including monks, stone masons and craftsmen, are discovering the romance of modern archaeology.

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CHEMISTRY

Alkali in Fine Varnish

The silicon in the varnish used by Stradivarius came from wood ashes. Now the secret of the "lost art" is solved, and this fine varnish can be duplicated.

► ALKALI extracted from wood ashes is part of the "lost art" of making old Italian varnish used centuries ago by Stradivarius, the Amati and other famous violin makers, Joseph Michelman of Cincinnati, Ohio, discovered.

Following this method, Mr. Michelman has been able to recreate a varnish similar both in appearance and chemical composition to the old Italian varnishes.

Through spectrographic analyses of samples of the old varnishes, made with the aid of Alan Goldblatt of Chicago, Mr. Michelman had previously discovered the principal elements in the brown varnish. These were aluminum, iron, silicon, sodium, calcium, magnesium, lead and manganese, in the order named. Aluminum, iron and silicon were present in all 12 specimens of brown varnish analyzed.

The "unexpected and constant appearance of silicon was perplexing," Mr. Michelman states.

He could account for the presence of the other elements but not for the silicon. And until this was accounted for, rediscovery of the so-called secret of Stradivarius could not be held valid.

By study of methods used by the old alchemists and apothecaries as recorded in writings of the years 1550 to 1750, before and during the period when the old Italian varnish was in existence, Mr. Michelman came on a satisfactory explanation for the silicon in their varnish.

Briefly, this is that the alkali they used to dissolve resin was extracted from wood ashes with water and lime. Silicon compounds are always present in wood ashes, and this, Mr. Michelman suspected, was the source of the silicon in the old Italian varnish.

Details of the duplication of the old method of making varnish are reported in the journal, *SCIENCE* (Sept. 22).

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ASTRONOMY

Mars Day Sky Is Deep Blue

► AN OBSERVER located on the surface of Mars would find a deep-blue daylight sky, Dr. Donald H. Menzel of Harvard University stated in an address to a special meeting of the Royal Astronomical Society in Dublin, Ireland.

"The polar caps of Mars are not great blocks of ice, but mere fields of hoarfrost, ice crystals like those on a windowpane or in the freezing compartment of an electric refrigerator. Their thickness is probably only a fraction of an inch and, during the long Martian summer, the frost caps slowly evaporate, without melting," he stated.

Unlike the earth, where only a minute fraction of the available moisture occurs as atmospheric vapor, Mars has a very sizable fraction of its moisture in the atmosphere. Even so, the humidity is extremely low—less than one-tenth of one per cent on the average, he said.

Once the polar cap has disappeared, within the season of the midnight sun, the polar

caps can become the warmest spots on the surface of the planet. The temperature may rise to 65 or 70 degrees above zero Fahrenheit, Dr. Menzel stated.

He agreed with Dr. G. P. Kuiper of Yerkes Observatory that some simpler forms of vegetation, such as lichens, may be present on Mars. This form of life would account for the dark markings that change their color values with the Martian seasons. He also agreed with Dr. Kuiper in stating that animal life of types similar to those observed on the earth would be unlikely.

To account for the difference in the size of Mars when photographs are taken by blue and by red light, an effect first noted by Dr. William H. Wright of Lick Observatory, Dr. Menzel suggested a thin layer of fine carbon dioxide (dry ice) snow some 60 miles above the surface of the planet.

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GENETICS

Study of Genetics Aids Cancer Research

► THE science of genetics is helping in the search for causes and cures of cancer, even though heredity is at present a variable and uncertain factor in human cancer. Dr. Clarence Cook Little pointed out at the Golden Jubilee Celebration of the science of genetics in Columbus, Ohio. Dr. Little is director of the Jackson Memorial Laboratory, Bar Harbor, Me.

"Unbalanced growth tendencies introduced from different parental backgrounds may be a potent and basic factor in tumor formation," he said.

In most types of cancer, heredity may be involved, but its effects are complex and often indirect and unpredictable."

"In laboratory animals, however, where the force of heredity can be controlled, concentrated and analyzed, it is a powerful and important element in creating strains which are remarkably free from cancer or those in which its incidence is very high, generation after generation."

The use of genetics, he added, not only aids cancer research but has developed principles applicable in the whole field of experimental medicine.

"The hormones which affect the origin and progress of cancer growth," he said, "are to a large extent controlled in their degree of development of genetic influences."

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On This Week's Cover

► ARTIFICIAL suns six inches in diameter and comparable in temperature to the surface of the sun in the sky were demonstrated by Dr. Russel A. Miller, project supervisor of the high temperature research laboratory, in Philadelphia at the new Research Institute of Temple University.

Rods of aluminum, magnesium, and other metals are burned in small furnaces made of each metal's own product of combustion. Oxygen under pressure forms the atmosphere in which the six-foot metal rods are burned. Pools of melted metal, their surfaces covered with flames of burning metal vapors, are the "suns," as shown on this week's cover of *SCIENCE NEWS LETTER*, whose brilliance can be used to measure the temperatures inside the furnace. Materials are studied at the Institute at temperatures up to 7,000 degrees to learn how to make rocket engines and high-temperature turbines of more resistant materials.

Rotating furnaces are among the devices used to get the maximum heat from burning metals. These throw melted metal in thin sheets against the refractory sides of the combustion chamber, allowing it to combine faster with the oxygen supply.

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GENERAL SCIENCE

Defense Plan Out-Moded

The present plan for civilian defense seems designed for World War II rather than for World War III. The civilian defense group needs broader powers.

► "THE NEW federal plan for civil defense seems to me to be more like a plan for World War II than for World War III, a plan for TNT bombs rather than for A-bombs, so far as its administrative aspects are concerned," James M. Landis, civil defense director in the last war, told Science Service.

The new plan was sent to Congress by President Truman on Sept. 18. It declares that the real responsibility and authority in civil defense lie with state and local governments, that the proposed Federal Civil Defense Administration shall confine itself mostly to advice, research and coordination.

"There should be some ultimate source of command direction," Mr. Landis said, "and that source should be the federal government itself. I am afraid that the authors of this new plan do not realize how hard it is to get neighboring states to work together."

Mr. Landis pointed out that not only are there often political differences between states, but also in industrial states, many times, the governors and the mayors of the principal cities do not agree.

"The possibility of A-bomb attacks," he went on, "makes it much more necessary to set up overall command of civil defense resources and manpower. It is the extent of devastation which determines the amount of mobilization of resources necessary to meet the attack."

"A-bombing will require much interstate action. This new plan is adequate for the kind of bombing envisaged in World War II instead of World War III."

Mr. Landis said he believes the nation is going a little slow in its planning for civil defense. Even under the philosophy of this new plan, the states and cities are not moving fast enough, he declared.

"Congress should act during this session," he urged, "to establish an operational Civil Defense Administration with broader powers than those envisaged in the legislation suggested by President Truman."

Mr. Landis added that he does not think Congress will act until the next session convenes in January.

The former dean of the Harvard Law School who took over World War II's civil defense effort from the late Mayor Fiorello La Guardia said he hopes that the relations between the military and civilian aspects of defense against A-bombs will be carefully worked out.

"In World War II," he recalled, "some of the military in this country didn't want

to bother with civil defense. Their attitude seemed to be that the civilians could take care of themselves.

"Military air defense areas," he advised, "should be carefully coordinated with civil defense areas, and the mobility of military resources should correspond with the mobility of civil defense resources."

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AERONAUTICS

Instrument Carrier Drops From Seven-Mile Altitude

► INSTRUMENT-CARRYING aviation models are being dropped with relative safety from airplanes at altitudes of from 35,000 to 40,000 feet, it was revealed at Moffet Field, Calif., at the Ames Aeronautical Laboratory of the National Advisory Committee for Aeronautics.

These instrument carriers are unpowered bomb-like models that fall by gravity. In their drops from such heights they may acquire speeds slightly faster than that of

sound. The type used, with test wings, tails and control surfaces on a streamlined body, weigh upwards of 1,000 pounds.

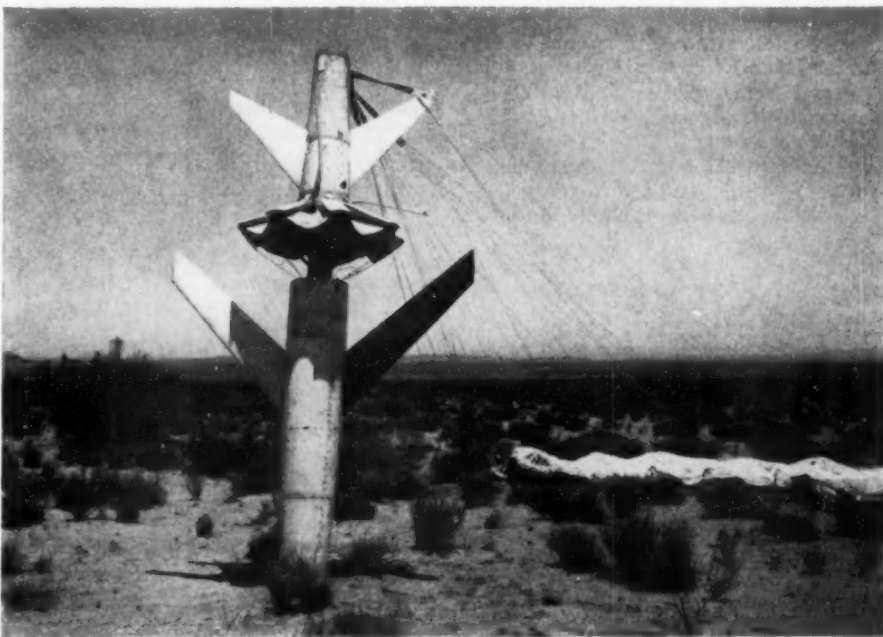
During the fall, engineers at ground stations determine the velocity of the falling body with optical and radar tracking units. Meanwhile, measurements of such factors as drag and lift on the body and the test wing, tail or control surface are being recorded on instruments inside the body.

The features that enable this falling carrier to hit the earth with little damage to itself and none to the instruments are dive brakes and a parachute. The dive brakes, strong umbrella-like devices, open at a pre-determined point. The parachute is automatically released from a storage compartment in the tail when the speed of the body has been slowed by the brakes to a point where the parachute can be safely used.

The falling body program is one of several methods employed by scientists of the NACA to obtain more complete information on aerodynamic forces at transonic speeds near that of sound. The speed of sound is approximately 760 miles per hour at sea level. The falling body methods are in addition to work with wind tunnels.

In one of the methods not using wind tunnels, small models are mounted on the wing of an airplane that goes into a speed dive during which the forces acting on the model are measured. A second method utilizes models mounted on rockets fired from the ground. A third utilizes the specially-built, rocket-powered Bell X-1 airplane and other jet engine planes.

Science News Letter, September 30, 1950



RECOVERY ASSURED—A free-falling body, after a drop of nearly seven miles, hits the earth. Its descent first checked by automatic dive brakes, shown open, and then by the parachute which is shown at the right, the body is buried nose first in the sandy soil of the California desert. The model wings are undamaged and the instruments and the records made during the fall are safe.

MEDICINE

Depth of Trance Measured In Hypnotized Person

► AN ELECTRICAL method for measuring the depth of trance in a hypnotized person is announced by Dr. Leonard J. Ravitz of Duke University School of Medicine in Durham, N.C.

The method is something like that of taking brain wave tracings, but brain waves do not show hypnotic trance depth. So electrodes are placed on the forehead and either hand of the person to be hypnotized, to measure voltage changes of the body.

During hypnosis, the tracing becomes more regular and electrical potential difference either gradually decreases or increases in magnitude. The voltage shifts dramatically at the end of the trance and the tracing becomes more normal.

The studies, made while Dr. Ravitz was at Yale University School of Medicine, are reported in the journal, *SCIENCE* (Sept. 22).

Science News Letter, September 30, 1950

INVENTION

Added Twinkles, Tinkles For Your Christmas Tree

► YOUR tinsel-decked Christmas tree will tinkle and twinkle with Yuletide joy if equipped with the latest addition to the age of gadgets.

U. S. patent 2,522,906 was issued to Leo R. Smith of Alexandria, Va., for a small vibrator designed to be attached to the trunk of a decorated evergreen tree. Plugged into the house circuit, the motor imparts a two-way shimmy which is imperceptible in the tree itself, the inventor says. But the tinsel and shining balls will thereupon dance and sparkle, and the tree itself will produce an "intriguing rustling sound."

Science News Letter, September 30, 1950

MEDICINE

Brighter Way to See Patient's Stomach

► DOCTORS will shortly be able to watch an image of what goes on inside a patient's stomach several hundred times brighter than the current fluoroscopic images. The new device, employing electronic methods and a fluorescent crystal, was developed by a University of Chicago physicist.

It will permit doctors to make routine or lengthy examinations for cancer and other diseases without fear of danger to the patient from too long exposure to X-rays and with a much clearer view of the patient's insides. Motion pictures of the image will also be possible with the new device.

Completion of the equipment, by Robert J. Moon, assistant professor of physics in

the university's Institute of Radiobiology and Biophysics, is reported in the university's *RESEARCH REPORTS*.

Mr. Moon points a television type electron gun at a target of tantalum foil. Some of the electrons, transformed into X-rays, are focused on the object to be X-rayed. After they pass through the object they hit a fluorescent crystal that changes the X-rays to ultraviolet rays. Their signal strength is multiplied many thousand fold and transmitted to a television-like viewing screen.

Science News Letter, September 30, 1950

GENERAL SCIENCE

M. I. T. Head Urges Total Draft if Total War

► ALL men of draft age should be drafted, if the emergency becomes worse. This is the opinion of President James R. Killian, Jr., of Massachusetts Institute of Technology. Once they are drafted, Dr. Killian said, they could be assigned to civilian as well as military duties.

Speaking at a banquet of the American Society of Mechanical Engineers, the M.I.T. President urged, however, that regardless of a general war, "a certain number of young men" should be required to continue their education in essential fields.

"Under such a complete draft," said Dr. Killian, "the problem becomes, not one of deferment, but one of where a man can best serve the country."

The educator urged that, in the present emergency, the educational programs should not be disrupted prematurely. Pointing out that the nation may be faced with either an international explosion or a series of Korean-like emergencies, Dr. Killian warned that, "if we prematurely disrupted or seriously curtailed our higher education, we could in the end wind up with a disastrous shortage of trained manpower which would weaken us for either contingency."

"You can't fight a modern war or maintain a modern peace without highly trained manpower," he went on. "You can't do either without first-rate scientists or engineers."

Science News Letter, September 30, 1950

AGRICULTURE

U. S. Cotton Takes Beating from Insects

► U. S. COTTON is taking the heaviest beating in many years from insects, the Agriculture Department reported.

Its monthly insect pest survey showed boll weevils, cotton leafworms, bollworms and pink bollworms were on a rampage. Texas and Oklahoma are at the center of the attack; in a regulated section of southern Texas, the pink bollworm has developed to serious proportions, the report said. In one county, losses in the field are running as high as 50%.

Science News Letter, September 30, 1950

IN SCIENCE

DENTISTRY

Caries in Offspring Result Of Disease in Pregnancy?

► THE possibility that a baby may be born with a harelip or cleft palate or with unusual susceptibility to tooth decay as a result of his mother having an infectious disease during pregnancy will be investigated by Dr. Seymour J. Kreshover of the Medical College of Virginia at Richmond under a dental research grant of \$8,320 from the U. S. Public Health Service.

Gum inflammations and diseases, which are the chief cause of tooth loss in grown-ups, will be attacked in research aided by two other grants just announced. A method of measuring the prevalence of one major gum disease, gingivitis, and a study of the relation of alcoholism, diabetes and other chronic diseases to gum inflammation will be carried on by Dr. Isaac Schour of the University of Illinois under two grants totalling \$19,720.

The largest single grant, \$18,478, was awarded to Dr. J. R. Blayney of the University of Chicago to aid a 15-year study of water fluoridation as a means of fighting tooth decay.

The 28 dental research grants made on recommendation of the National Advisory Dental Research Council total \$187,076.

Science News Letter, September 30, 1950

ENGINEERING

Two Gallons Gas Equal To Three of 25 Years Ago

► TWO gallons of today's antiknock gasoline are worth as much in power as three gallons of the gasoline of 25 years ago which cost about the same per gallon disregarding taxes.

This claim was made in Detroit and backed up by road tests conducted by the Ethyl Corporation, using various automobiles, including a 1921 touring car, two 1950 models with experimental engines with low and high compression ratios and a couple of standard production 1949 models.

The 1921 model using fuel of 1925 vintage made 14.95 miles per gallon, the modern car with 4.5 to 1 compression ratio gave 16.08 miles per gallon on the same 1925 antiknock fuel, while the modern car with 8 to 1 compression ratio engine on 1950 premium gasoline gave 25.7 miles per gallon.

A test with the two current models with standard 7.5 to 1 ratio showed that today's gasolines and engines provide improved acceleration and hill climbing ability.

Science News Letter, September 30, 1950

SCIENCE FIELDS

CHEMISTRY

Powdered Starch in Candy Factories Is Dangerous

► NEVER mind TNT factories. U.S. candy makers are in a pretty dangerous business themselves, explosion experts of the U.S. Bureau of Mines reported in Washington. They handle a ticklish raw material: powdered starch. When enough dust from the starch meets a source of ignition, said the Bureau's explosive researchers, there is apt to be a solid, resounding blast. "Explosion pressure relief vents should be provided in plants to reduce structural damage," the report says meaningfully.

Experiments in Pittsburgh laboratories of the Bureau of Mines are laying the groundwork for a safety code aimed at preventing dust explosions in the confectionery industry. One such severe starch-dust explosion occurred two years ago in a large candy factory. The safety code will be prepared under auspices of the National Fire Protective Association.

Science News Letter, September 30, 1950

NAVIGATION

Traffic Theories Can Keep Store Sale Crowds Moving

► THE PROBLEM of how to keep crowds moving to and from a bargain counter on a big sale day can be solved by using the same theories that apply to airport or railroad traffic control.

Proper navigation is a vital problem in war or peace, Dr. Paul Rosenberg, president of the Institute of Navigation, told the three-day joint meeting on Navigation and Electronics in New York.

"From pedestrian to canal barge, and from submarine to rocket," there are certain navigational problems common to all, Dr. Rosenberg stated. He urged that these common factors be integrated into a single, unified science. Heretofore, he said, scientists have been tied up with the intricacies of highly specialized fields, such as radar or loran.

"For example," Dr. Rosenberg stated, "a vacation tourist puzzling over an automobile road map in New England may present an amusing picture to a professional navigator, but the situation loses its humor when the selfsame type of navigational problem is encountered by a lost army patrol trying to find its way back to the U.N. lines in Korea."

Another example he cited was the importance of upper atmosphere and interplanetary navigation in the development today and tomorrow of long range rockets

and guided missiles.

Devices to guide blind persons now being tested use navigational methods and principles common to radar and sonar, Dr. Rosenberg stated.

Electronic navigation is "vital to all phases of military activity at sea, on land, and in the air," he concluded.

The meeting is sponsored by the Institute of Navigation, and two government-industry Radio Technical Commissions for the Marine Services and Aeronautics.

Science News Letter, September 30, 1950

ENGINEERING

Sawdust Houses Stand Against Big Bad Wolf

► AND the big bad wolf said, "I'll huff and I'll puff and I'll blow your house in." But the lazy little pig—not the industrious pig who had built his house of brick—laughed and said: "Ha, ha, ha, I've built my house of sawdust, and you can't blow my house in."

Well, the big bad wolf thought this was exceedingly silly so he huffed and he puffed—but, try as he would, he could not blow in the lazy little pig's sawdust house.

You see, kiddies, the lazy little pig had built his house of high quality synthetic lumber made of pressed sawdust and wood shavings bonded with synthetic resin. Robert A. Caughey, research director of Souhegan Mills, Wilton, N.H., told the American Society of Mechanical Engineers meeting in Worcester, Mass., that this kind of lumber could be made of woods now considered either decidedly inferior or completely unusable. And, he said, it would cost much less. He declared that these synthetic boards often would do a better job than the real stuff now in use.

Science News Letter, September 30, 1950

INVENTION

Salt Removed from Ocean Water

► A CHEMICAL sleight of hand trick for removing salt and minerals from sea water was awarded patent 2,522,856. The inventor, Arthur M. Buswell of Urbana, Ill., has assigned all rights to the government, as represented by the Secretary of the Navy.

The new process produces drinkable water from the ocean. Most likely users: castaways on lifeboats or life rafts.

When a fresh water cask becomes empty it may be filled from the sea. About three-quarters of a pound of powdered silver fluosilicate is added per gallon of saltwater to remove the salt. When the solids have settled, the water is poured off into another cask, and about half an ounce of ordinary lime is added. After this settles, taking with it magnesium and the fluosilicates, the water is ready for drinking.

Science News Letter, September 30, 1950

ZOOLOGY-CHEMISTRY

No More Sugar for This Little Worm

► WESTERN sugar beet growers, who regard a tiny worm as one of their biggest pests, now have a new soil fumigant which may help them take a sizable amount of growing sugar back from this parasite.

The fumigant is a mixture of chlorinated hydrocarbons forced into the ground through nozzles, where the liquid vaporizes and kills most of the roundworms, or nematodes, in the vicinity. Northern Utah farmers who tried it last summer more than tripled their beet yield per acre, compared to unfumigated land.

The roundworms, an official of the Beet Sugar Development Foundation in Fort Collins, Colo. said, sometimes completely strip a badly-infested field of its crop. They are seemingly immune to ordinary insecticides, including DDT.

The new treatment is not permanent. It lasts only one year. It is so toxic, moreover, that it must be used at least two weeks before planting, or the fumigant will kill the sugar beets as well as the worms.

Science News Letter, September 30, 1950

AERONAUTICS

Join the Air Force To Sleep in Hammock

► FROM the days of wooden frigates to the six-engined might of the B-36, military life has turned full circle. The Air Force now is putting hammocks into its biggest bombers.

At Wright-Patterson Field in Dayton, the Air Materiel Command showed off an adjustable sleeping hammock made of nylon netting. A pair of the swinging bunks are to be installed in the forward flight compartment of each B-36 for use by standby crew members during rest periods.

Not that the B-36 doesn't have regular bunks. The giant plane has permanent sleeping facilities in a compartment near the tail. But it is a long crawl, inching on hands and knees through a tunnel cat-walk, for pilots, radio operators and flight engineers to reach the bedrooms to the rear.

The new hammocks are designed for catnaps up front, between hitches of flying during non-stop flights which last several days. They are a far cry from hammocks used in the day of iron men and wooden ships. These have adjustable support straps which mold the flexible netting to the body beneath the head, neck and knees. Tested by both Air Force and Navy personnel, the new swinging beds got top comfort rating.

Apparently the Air Materiel Command expects airmen to be hefty—or else it is merely preparing for the heftiest. The new hammocks are strong enough to hold 600 pounds.

Science News Letter, September 30, 1950

SAFETY

If Atom Bomb Hits

Getting victims to safety is the first rule in case of atomic attack. The time-honored first aid rules of yesterday have been modified.

By JANE STAFFORD

This is the first of a series of articles on the new first aid for atom bomb casualties.

► FOR defense against an atomic war, the nation needs 20,000,000 lay persons trained in first aid. And those 20,000,000 will need special training in new things to do to save atom bomb victims. Some of these things will be so modified as to seem almost the reverse of what you do normally in giving first aid to a highway accident victim or an injured workman in your plant.

You remember from the Red Cross first aid course you took during the last war that the first thing you were taught was to keep an injured person lying down.

"DON'T let an injured person get up."

"DO keep an injured person lying down," read the instructions in the American Red Cross First Aid Textbook, with pictures to emphasize this important lesson.

Reversal in Rules

But if you are going to give first aid to victims of an A or H bomb, you may not always be able to follow these time-honored directions. Your first job may be to get the injured person to safety, regardless of whether he is fainting or has broken bones. If fire is creeping close, if the walls of nearby buildings are about to fall, and if you are alone with half a dozen badly injured persons, you will not be able to "splint them where they lie."

In case of an atom bomb explosion it may be that the most life-saving thing you can do will be to rescue the injured from areas of hazard. It may be possible to give topnotch first aid care to many victims and this should be done wherever possible. But where there are many cases of badly injured and equipment is lacking, many of your carefully learned first aid lessons may need to be changed.

In the first aid course, for example, you learned to be careful about every minor cut and scratch, cleansing them thoroughly and perhaps applying a sterile dressing to guard against infection. In the event of an atom bomb attack, some of your patients may be covered with tiny cuts and scratches from flying glass. But in a critical situation, you will pay no attention to these, and if that is all the injury the person has, you will send him on his way home or to shelter, telling him to see his doctor a few days later when things have quieted down. The reason: There will be too many seriously injured needing your care.

You learned in the Red Cross first aid class to see what injuries the patient had and to care for the most serious ones first. You will be doing the same thing in case of an atom bomb attack, but on a much larger scale and with one important new feature added.

Geography in First Aid

This new feature may well be included in the first lesson you will get in first aid courses revised and expanded to meet the needs of atomic war. This first lesson may be on the geography of an atom bomb attack as it relates to first aid to the injured. Through it you will learn to think of your home town in terms of circles or concentric rings, like the rings that spread out from the center when you drop a stone in a quiet pool of water.

At the center is the point where the bomb drops, if it is an air burst. What you do in the way of first aid depends on where you are in relation to this central point. Up to one mile out, in all directions, from this central point, will be the area of very heavy destruction from the blast damage

and of deadly dosage of radiation. Most of the people in this area will be killed, but a few will survive. Authorities estimate that about 5% of people in this first zone will survive and not even suffer damage from radiation. The figures are based on the Japanese experience. Survival of these few people was due to the fact that they happened to be in places where they were sheltered both from blast and radiation.

Modified Aid in Second Circle

For the next mile out in all directions there will be heavy blast damage and this is also the "dangerous dose" area of radiation. Here is where you will apply your modified first aid. This is the hazard area where there may be fire, falling walls and flying debris that could kill you and your patient while you are taking time to apply a splint or a tourniquet to stop bleeding.

Here also is the place where you probably will not have any splints or tourniquets or sterile dressings to apply even if you had the time. They will either have been destroyed or so covered with debris that you could not get at them. So you look first, as always, for signs of shock and bleeding, but also for signs of approaching fire or shaky walls.

If the patient is bleeding profusely, you put your hand right over the bleeding place and press hard enough to check the bleeding. You keep up the pressure while you lead the man or woman to safety. More likely, you will have to show the patient where and how to use pressure



MASS INJURY—In case of an atom bomb attack on your city, the scene from a Reno, Nev. fire in which more than 180 persons were so badly hurt they had to be sent to hospitals may be repeated hundreds of times every few blocks throughout the city.

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and send him on his way while you go on to care for the next victim, and the next, and the next.

You may notice the symptoms of on-coming shock as you have been trained to do, but whether you have the patient lie down and try to keep him warm, to prevent shock, or whether you send him on to a safer area or to his home will depend on the situation with regard to the likelihood of further damage and injury.

You do not need to worry or even think about the radiation effects. Up to the present, there is nothing in the way of first aid treatment that will overcome the effects of a heavy dose of radiation. All the things that can be done, including the new methods now being tested in laboratories, for helping toward the possible recovery of patients who got heavy doses of radiation, will have to be done by doctors and nurses. Your role as a first aider will be to keep the surviving victims from bleeding to death or getting further fatal injuries before the doctors and nurses have a chance to try to treat the radiation effects.

Running Away Useless

Remember this about the radiation from an atom bomb: It is all over in a minute or so. About 99% of the radiation produced comes out in the first fraction of a second after the bomb goes off. By the time you have picked yourself up, realized what has happened and pulled yourself together and begun to think about using your first aid training to help those around you, the worst is over. You will gain nothing by running away. You can safely stay and help those who need help.

Next in the geography of atom bomb first aid are the areas between two and four miles out from the center where the bomb was dropped. Here the damage will be moderate to slight. Most buildings will be standing, there will not be much fire danger, but there may be many casualties.

Place for Top First-Aid

About 20% or 25% of the people in these two outer areas of a mile each will be killed. Many others will have severe injuries. There may be bad leg cuts that are bleeding profusely. Quick, proper treatment can save many lives here. And this is the area where topnotch first aid can and should be given.

You will have time to do it because there will not be so many injured in your immediate vicinity, and you will have splints and other equipment to use. But even though you may see only two or three or five badly injured persons, the total number will be large because the area is circular. So the total number of trained first aiders must be large if people in this area are to be saved.

You will not, of course, stop to consult a map to see which area you are in after an atom bomb burst. Nor will you be able

to tell the exact point where the bomb fell. But if most of the buildings are down and you see fire, you are near the central area.

If only a few buildings are down, and those mostly the small brick structures, you are probably out in the moderate to light damage areas. The one-, two-, three-, and four-mile circles may each be larger, depending on the power of the atom bomb dropped.

Science News Letter, September 30, 1950

BOTANY

Explorers to Visit South American "Lost World"

➤ AN EXPEDITION to the "lost world" of South America, one of the world's least explored areas, is being organized by the New York Botanical Garden and its Venezuelan associates to study some of science's most interesting plants.

Penetrating into the most remote part of Venezuela where high sandstone mountains create an isolated region, three American botanists and their Venezuelan colleagues will be gone about half a year. Organized by Dr. William J. Robbins, director of the New York Botanical Garden, the expedition party will consist of Bassett Maguire, curator, John Wurdack and Richard Cowan, botanical assistants.

Explorations will be concentrated in the Orinoco headwaters and they will visit particularly Haumacari and Yacapana, two of the sandstone plateaus. Neither has been explored botanically and, as far as is known, the first has never been scaled.

Instead of taking dollars to pay the Indians of the region for their aid, trade goods of use to them are being carried by the scientists. Among the articles desired by the Indians are quantities of lipstick, which they use to decorate their faces and bodies.

The Venezuelan mountains were the setting of Doyle's fanciful story of the Lost World.

The New York Botanical Garden already has a major botanical collection of the region.

Science News Letter, September 30, 1950

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by Frank Gaynor

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AERONAUTICS

Electric Ovens Provide Hot Food for Combat Crews

➤ IMPROVED electric ovens for giant bombers and troop carriers on long flights have been developed in Dayton, Ohio, at the Wright-Patterson Air Force Base. They will provide the means of supplying hot food to the largest crews even during a round-the-world non-stop trip.

The heaters are of different designs and different sizes. Bombers such as the B-29 and B-50 will be equipped with two ovens designated as the B-3, which can heat eight cans of a special complete ration in 11 minutes.

It is an oven with two shelves, and is heated with 400-watt and 120-watt units. Heat is regulated by thermostatic controls to prevent temperatures higher than that of boiling water, thus keeping the cans from exploding.

For troop-carrying planes, larger heaters are available. Some will heat 48 cans of rations in 35 minutes. Another oven is designed particularly for frozen foods. It can heat six frozen meals in 35 minutes, and has removable shelves so it can be used for canned rations.

Along with the development of these ovens, new types of canned rations have been developed. These tasty pre-cooked canned meals, known as IF-2 rations, contain such foods as boned chicken, beef and pork loaf, ground meat and spaghetti. They contain also fruit, crackers, cookies and candy for dessert. The frozen dinners contain meat, potatoes and a green vegetable, all wrapped in expendable aluminum trays.

Science News Letter, September 30, 1950



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MINING

Uranium Mining, Milling

► URANIUM mining for the essential atomic energy mineral is private business in the United States.

Under the policy of the U.S. Atomic Energy Commission the job of finding, mining and processing uranium ores is left to the mining industry, the American Mining Congress was told in Salt Lake City.

The government is the only buyer. It fixes the ore-buying price. Prices are fixed to encourage prospecting and mining. The Commission is helping the industry by making geological surveys, by furnishing free testing and assaying service and, more important, by guaranteeing a market for the uranium ores.

The domestic uranium policy of the Atomic Energy Commission was explained by Jesse C. Johnson of the Commission. When the policy was first announced two years ago, there were only 15 individual uranium mining operations employing a total of 55 men, he said. Today there are over 200 different mining operations with total employment in excess of 1,000, and production is at an all-time high.

This increase in production has been achieved without government financing of private operations. All the ore is produced from privately-owned mines and over 80% is processed in privately-owned plants.

This indicates, he declared, that uranium mining can be a profitable business. It indicates also that the prices paid are sufficiently attractive to induce mining companies to develop and operate mines and construct uranium milling plants.

Uranium milling, introduced in 1942 and now boasting six mills, is destined to play an important role in the field of mining and milling.

The American Mining Congress was given a review of uranium production by F. W. McQuiston, Jr., of the U.S. Atomic Energy Commission. Uranium is widely distributed in the rocks of the earth's crust, he said, but it occurs sparingly as high-grade ore deposits. It is more plentiful than gold and silver, and almost as plentiful as lead and zinc.

The six mills now operating are in Colorado and Utah. One other is under construction and two more are planned for the near future. First important operations were the leaching of accumulated piles of tailings from milling vanadium ores in Colorado. It is definitely indicated, he declared, that in the near future several million tons per year of low-grade materials will be milled for the recovery of uranium.

Canadian and other foreign operations are producing uranium. The largest milling operations on which information is available are those at the Shinkelowbe mine,

Belgian Congo; Eldorado mines, Great Bear Lake, Canada; and on the Colorado plateau in Colorado and Utah. Gold production in South Africa, oil shale in Sweden and marine phosphate deposits in the United States offer potential by-product uranium production.

Of the great variety of uranium occurrences, pitchblende ores have been by far the most productive. Uraninite, another primary mineral, has considerable economic importance. Certain secondary minerals have also contributed to uranium production.

Science News Letter, September 30, 1950

INVENTION

Steam-Heated Chair For Winter Comfort

► STEAM-HEATED chairs, to give comfort to persons in a theater or auditorium, may also be used for cooling in summer by circulating cold water through the pipes that carry steam or hot water in the winter. This "temperature-controlled seat" was awarded a patent by the government recently.

The support that holds the seat is a pipe to carry steam, hot water or cold water. The seats, including the backs, are made of endless metal straps. Being metal, they are conductors of heat. Since the straps are attached to the pipes that carry the hot or cold liquid, they pass the temperatures on to the users.

The inventor is Eric G. Pophal, St. Pauls, N. C. Patent 2,521,091 was awarded to him.

Science News Letter, September 30, 1950

GENERAL SCIENCE

Nursing Students Ignorant of Sex Matters

► NURSING students are "abysmally ignorant" on matters of sex, Drs. Albert Ellis and Earl W. Fuller found from study of questions asked by third-year students at the New Jersey State Hospital, Greystone Park, N. J.

The questions were raised at round table discussions held by the director of the Mental Hygiene Clinic. They were dropped anonymously in a closed question box. The girls were free to bring up any problems, particularly those they would hesitate to discuss with parents or teachers.

A total of 1,908 questions were asked by over 2,000 students. It was found that 39% were concerned with love, marriage and family affairs, 31% with specific sexual topics, and only 30% with non-marital, non-sexual topics.

The most naive questions were asked by these girls regarding sex, revealing their lack of sexual education not only at home and in school, but in their nursing training.

Even though the girls were preparing for nursing, a career notable for its high percentage of unmarried women, they were particularly concerned with all aspects of marriage, from dating and falling in love to the bringing up of children.

Drs. Ellis and Fuller compared the questions asked by these nursing students to questions asked by American soldiers in sex talks reported by Dr. Fred Brown of Mount Sinai Hospital, New York.

The girls were more concerned than the soldiers about pre-marital and extra-marital intercourse, birth control, petting and sex education. The soldiers were more interested than were the girls in abstinence, sex "perversions," menstruation, pregnancy and abortion.

Some of the questions asked by the nursing students:

What is love? Can there be love at first sight? What do you think of blind dates? What is the ideal length of time for an engagement? What is your opinion of trial marriage? How far should a girl go in petting? What is sex? Should a girl be ashamed to undress in front of other nurses?

Science News Letter, September 30, 1950

AERONAUTICS

Rear-Facing Plane Seats For Greater Safety

► A FORWARD step toward the adoption of rear-facing seats in airplanes was revealed in Dayton, Ohio, at the Wright-Patterson Air Force Base. It is the development of a strong, light-weight aft-facing seat that can withstand forces almost three times as great as its front-facing predecessors.

Rear-facing seats in airplanes have long been advocated by airplane safety engineers. The backs and headrests provide a far greater degree of support in case of a crash landing than the present straps around the front of the body. Tests made show that the human body can withstand very high forces when sitting in the backward-facing seats.

Light weight in these new seats is obtained by the use of aluminum sheet, replacing the customary steel tubing. Foam rubber is used for padding. Plastic seat covers are used over the foam rubber. This plastic, already in use in automobiles, is a long-wearing type, resistant to moths, mildew, fungus and fire.

The new seats were developed by the Aero Medical and Aircraft Laboratories at the Air Force Base in Dayton. Beech Aircraft Corporation will build the seats. The first large installations will be in 20 C-54s used to carry soldiers by the Military Air Transport Service.

Science News Letter, September 30, 1950

ENTOMOLOGY

**Mosquitoes, Young or Old,
Use Tactics of Modern War**

► **BABY** mosquitoes crash dive for the bottom when startled by shadows or electrical impulses. Adult mosquitoes, out on an air raid with blood in their eye, fly at different altitudes, according to their type.

These two bits of information are offered by scientists on opposite sides of the world. It seems man has nothing on the mosquito in practicing the tricks of modern warfare.

Studies on the "crash dives" that mosquito larvae use as their sole means of defense are reported by an Australian zoologist, Dr. I. M. Thomas of the University of Adelaide, in the *Australian Journal of Scientific Research* (Feb.).

Dr. Thomas found he could startle the baby mosquitoes into diving by turning lights off and on or by sending a mild electric shock through the experiment tanks—but only for a while. After the process had been repeated a number of times, the larvae apparently said, "Nuts, there isn't any wolf!" At any rate, they stopped diving.

In the savanna country of eastern Colombia, Dr. Julian de Zulueta reports in the British journal, *Nature* (July 29), mosquitoes of different species fly at different heights above the grass-tops while searching for animal blood.

The jungle mosquitoes do not like to cross areas cleared of grass, however, it was found by the researcher of Colombia's Ministry of Hygiene. Donkeys staked out in a clearing attracted far fewer mosquitoes than if tethered out in the savanna.

Science News Letter, September 30, 1950

PSYCHIATRY

**Organization to Work for
People's Peace of Mind**

► **GREATER** peace of mind for people throughout this nation and the world is the hope of a new organization formed in New York.

The organization is the National Association for Mental Health, Inc. It aims to "promote the welfare of mankind" by working for more adequate care and treatment of the mentally ill and mentally retarded, improvement and expansion of training programs for psychiatric and allied professions, stimulation of research and dissemination of information to the public about mental health and ways to preserve it.

The new association was formed by a merger of three voluntary organizations in the mental health field: the National Committee for Mental Hygiene founded in 1909 by Clifford Beers, author of *A MIND THAT FOUND ITSELF*; the National Mental Health Foundation; and the Psychiatric Foundation.

Staff members of the three organizations will comprise the staff of the new association. President is Oren Root of New York, and medical director is Dr. George S. Stevenson, for many years medical director of the National Committee for Mental Hygiene.

Science News Letter, September 30, 1950

OCEANOGRAPHY

**Anchovies off West Coast
Are Sardine Supplement**

► **ANCHOVIES** off the Pacific Coast may supplement the commercial sardine catch. A "census" of these silvery, greenish-backed fish has been completed in La Jolla, Calif., as a first step toward that possibility.

The survey was made by Dr. J. L. McHugh, assistant marine biologist of the University of California's Scripps Institution of Oceanography.

He found that at least three types of anchovies inhabit the open ocean waters of the Pacific Coast and at least two types make their homes in the sheltered bays.

One type of ocean-going anchovy is found from British Columbia to Monterey, Calif., a second type from Monterey to Cedros Island in Lower California; and a third type from Cedros Island to the southern tip of Lower California.

Science News Letter, September 30, 1950

PHYSICS

**Shimmer Affects Spotting
Dark Objects on Horizon**

► **THE VISIBILITY** of a dark object seen against the horizon is affected not only by the scattering of light by the atmosphere, but by "shimmer" or "optical haze."

A method of measuring this "shimmer," so important to military operations, is reported in the *Journal of the Optical Society of America* (Aug.) by Drs. Howard S. Coleman and Harold E. Rosenberger of the University of Texas in Austin, Tex.

Shimmer is due to small scale convection currents that cause small air masses of different optical density to cross the line of sight. Momentarily, the light from the background is directed along the line of sight and the light from the object under observation is directed elsewhere. The net result of this is a lessening of apparent contrast when a dark object is viewed against a bright background such as the sky or the horizon. In the case of a bright object viewed against a dark ground, there is no change in contrast.

The size of the object has a lot to do with the effect of optical haze on visibility. The nearer the size of the image of the object approaches the size of the entrance pupil to the photosensitive receptor used to "see" it, the more shimmer will diminish contrast.

Science News Letter, September 30, 1950

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Raccoon

► A CHUBBY little bandit with the brain and dexterity of a second-story man no longer furnishes college sophomores with the touchstone of campus success, but the raccoon is the reason why many youngsters think Daddy was awfully fat while still a member of the Class of '28. In those days there was many an athlete who was a lithe demon on the gridiron and a Bacchus, at least in bodily outline, off it. So much for the effects of the coonskin coat.

Raccoons are relatively primitive animals in zoology's family tree, although they more than live up to the black burglar's mask Nature gave them. Like the hands of monkeys and men, the raccoon's paws are unspecialized: they can be used for a variety of purposes, and usually are. They can unlatch chicken coop gates, husk sweet corn, break open a mussel shell or solve the special marauder-proof lid of a garbage can. In zoos, raccoons have nearly the pulling power of the monkey house. They handle things incessantly, and in addition splash around fondly in the monkey's bane and horror—water.

It is not true, however, that raccoons instinctively wash everything before eating it. If a crayfish is covered with mud, back into the stream with it for a quick rinse. If an earthworm looks dry and wrinkled, let it soak for a time. The raccoon washes for a reason: despite his fabulous appetite, he cannot be accused of drooling over his food, for his mouth is poorly equipped with saliva glands. He uses water to help him soften dry, harsh items on his menu. Give him a tree full of red-ripe cherries, or a fine fat frog, and there will be no time lost in needless scrubbing.

With mice, earthworms, birds, fruit, milk corn, frogs, fish, insects, turtle eggs, shellfish and clams on his diet the coon is no lank and stringy specimen. He spends most of his waking hours gorging himself, sleeps off the lethargy of an over-stuffed stomach, then begins another feast. The result is a well-rounded contour which makes raccoon a choice item at sportsmen's dinners, and lets him sleep away long

winter weeks without so much as an acorn stored in his hollow tree.

When treed by dogs or backed into a tight spot with his family, however, the roly-poly raccoon is a fierce and reckless fighter. Any hound that lives to an old age after a life of coon-hunting will be covered with scars from slashing paws he could not dodge.

Wary old raccoons resort to many tricks to befuddle dogs hard on their heels. Instances are reported where a coon will lead a dog into a stream, jump on the dog's head from the bank, and thereupon ruthlessly drown the pursuer.

Science News Letter, September 30, 1950

ENGINEERING

Reflecting Aluminum Cools and Heats House

► BY LIVING within rooms that are covered, ceiling, walls and floor, with heat-reflecting aluminum foil, Dr. and Mrs. Clarence A. Mills are able to keep cool in summer and warm in winter without conventional heating or air-conditioning, insulation or weatherstripping.

In the experimental residence named Reflection Point now open for inspection in Cincinnati, the University of Cincinnati authority on climate has applied reflective radiant conditioning so thoroughly that no attempt is made to heat, cool or change the moisture content of the outside air admitted summer or winter.

Around the top of the walls is an aluminum trough containing cooling coils for summer use and electric heating elements for winter. Figured aluminum foil on walls and ceiling, and similar foil atop the concrete floor slab covered with foam rubber and nylon carpet, reflect the heat in winter to the bodies of people in the room. The occupants are comfortable regardless of the room's temperature. In summer the process is reversed.

The system is turned off and on like lighting by a wall switch, and it is used only when a room is occupied. Unheated air from the outside is filtered electrostatically to remove dirt and dust. Sufficient indoor pressure is created to give an outward draft through all cracks and openings through which dust might enter.

Operating costs can be reduced by the system, Dr. Mills reports. With a 96-degree exterior heat, the reported cost of cooling persons in all seven rooms was two kilowatts an hour for actual operating times or roughly 25 cents per ten-hour operating day.

The system can be applied to old buildings as well as new construction, it is claimed. The principles are also being investigated for use in hotels, high-speed jet-propelled airplanes, army tanks, ships, temporary housing in polar cold and tropical heat, farms and even in clothing.

Science News Letter, September 30, 1950

AGRICULTURE

Young Forests Given Help by Weed-Killers

► WEED-KILLING chemicals used widely on farms and gardens are being tested as a possible aid in making young forests grow.

When a forest burns, replacing it is more than a matter of simply planting seedlings. Underbrush, weeds and scrub trees with little value but prodigious powers of survival move in and choke the desired trees, robbing them of sunlight and moisture from the soil.

Working on the notion that seedlings might take firmer foothold on land wiped clean by chemical poisons, scientists at a U. S. Forest Service experiment station at Upper Darby, Pa., began decimating test plots in the Allegheny National Forest with weed-killers.

The chemical ammonium sulfamate, better known to home gardeners under the trade-name Ammate, proved effective. Sprayed on at the rate of 435 gallons per acre, it killed all vegetation on the treated plots. Two years later, the plots were still fairly open. Test trees planted after the first year in the poisoned soil apparently were not affected, however. They were free to grow straight and tall.

There is one small hitch to the new technique for preparing planting sites, the scientists admitted. At present, the most successful ammate treatment would cost about \$50 an acre. In a burned-over area of thousands of acres, the bill for helping a new forest along apparently would give pause even to the U.S. government.

Science News Letter, September 30, 1950

AERONAUTICS

Doubling Navigator's Work With More Space, Equipment

► IF airplane navigators on flights in the middle latitudes were given proper equipment and workplaces, they could do not only their own work but that of an additional crew member. Psychologist Julien M. Christensen, Wright-Patterson Air Force Base, reported his conclusion, based on a study of 12 navigators during some 120 hours of flight, to the meeting of the American Psychological Association in State College, Pa.

The present arctic navigational crew could be reduced from two or three men to one. The arctic navigator spends 34% of his active time on paper work, Mr. Christensen found. Less than half his time is spent on instruments. The navigator in the middle latitudes spends an even greater proportion of his time (46%) on paper work.

Techniques such as log work and celestial solutions must be made more efficient if they are to work in modern high speed aircraft, Mr. Christensen concluded.

Science News Letter, September 30, 1950

Books of the Week

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THE ART OF BRICKLAYING—J. Edgar Ray—Bennett, 240 p., illus., \$4.00. A text for the apprentice.

A. S. T. M. STANDARDS ON GLASS AND GLASS PRODUCTS—A. S. T. M. Committee C-14—American Society for Testing Materials, 107 p., illus., paper, \$1.50. Standard specifications and tentative methods of test pertaining to glass and glass products.

AUTOMATIC TRANSMISSIONS—Jud Purvis—Goodheart-Willcox, 264 p., illus., \$4.00. A simplified discussion of automatic transmissions and how they work.

BACTERIOLOGICAL TECHNIQUE: A Guide for Medical Laboratory Technicians—W. W. McEwen—Chemical, 293 p., illus., \$4.50. A basic manual for the student technician.

BORON, COPPER, MANGANESE, AND ZINC REQUIREMENT TESTS OF TOBACCO—C. W. Bacon, Wilbur R. Leighty and James F. Bullock—Gov't. Printing Office, U. S. Dept. of Ag. Tech. Bull. No. 1009, 27 p., illus., paper, 10 cents.

CAMPING: A Guide to Outdoor Safety and Comfort—Arthur H. DesGrey—Ronald, 171 p., illus., \$3.00.

THE CEREBRAL CORTEX OF MAN: A Clinical Study of Localization of Function—Wilder Penfield and Theodore Rasmussen—Macmillan, 248 p., illus., \$6.50. A monograph on the function of the cerebral cortex in man.

THE CLINICAL USE OF RADIOACTIVE ISOTOPES—Bertram V. A. Low-Beer—Thomas, 414 p., illus., \$9.50. A textbook on the basic principles of artificial radioactivity.

CONSERVATION OF NATURAL RESOURCES—Guy-Harold Smith, Ed.—Wiley, 552 p., illus., \$6.00. Leaders in the field of conservation discuss America's forests, water, minerals and other resources and recommend policies to conserve them.

CRUDE OILS—Chemical and Physical Properties: The Science of Petroleum, Vol. V, Part I—Benjamin T. Brooks and A. E. Dunstan, General Eds.—Oxford University Press, 200 p., illus., \$11.00. This is the first of three parts dealing with chemical engineering, chemistry and physics of petroleum.

ELECTRICITY IN THE HOME AND ON THE FARM—Forrest B. Wright—Wiley, 3rd ed., 280 p., illus., \$3.96. For those who wish to gain a practical knowledge of electricity and its applications.

ELEMENTS OF HUMAN PHYSIOLOGY—Miriam Scott Lucas—Lea & Febiger, 2nd ed., 357 p., illus., \$4.75. An introductory text written from the point of view of the teacher and student.

THE FIRST BOOK OF STONES—M. B. Cormack—Watts, 93 p., illus., \$1.50. If your child collects stones, this book will help him to grasp the significance of the variety. Well illustrated by M. K. Scott.

FOREST PRODUCTS: The Harvesting, Processing, and Marketing of Materials Other Than Lumber, Including the Principal Derivatives, Extractives, and Incidental Products in the United States and Canada—Nelson C. Brown—Wiley, 399 p., illus., \$5.00.

GENETICS—THE SCIENCE OF HEREDITY—John Pfeiffer—Public Affairs Committee, 32 p., illus., paper, 20 cents. The author reports on possibilities now shaping up in the genetic laboratories. A brief history of genetics is included.

GEORGE DAVID BIRKHOFF COLLECTED MATHEMATICAL PAPERS, Vols. I, II, III—D. V. Widder, Chairman Editorial Committee—American Mathematical Society, Vol. I, 754 p.; Vol. II, 983 p.; Vol. III, 897 p.; illus.; set, \$18.00. A collection of Dr. Birkhoff's papers which include boundary value problems, the dynamics of these problems and the four color problem.

GIORDANO BRUNO: His Life and Thought—Dorothea Waley Singer—Schuman, 389 p., illus., \$6.00. Also included is an annotated translation of Bruno's work "On The Infinite Universe and Worlds."

HOW TO HELP YOUR CHILD IN SCHOOL—Mary and Lawrence K. Frank—Viking, 368 p., \$2.95. Helpful information for parents of children who are in elementary school.

AN INTRODUCTION TO THERMODYNAMICS, THE KINETIC THEORY OF GASES, AND STATISTICAL MECHANICS—Francis Weston Sears—Addison-Wesley, 348 p., illus., \$6.00. A text for advanced undergraduate students of electrical engineering.

LABORATORY DIRECTIONS IN GENERAL BIOLOGY—Harold Tupper Mead—Educational, 120 p., illus., paper, \$2.00. Directions have been prepared with no particular text in mind.

MANHOOD OF HUMANITY—Alfred Korzybski—The International Non-Aristotelian Library (Distributors: Institute of General Semantics), 326 p., 2nd ed., \$4.50. New edition of the first book by this pioneer in semantics.

A MANUAL OF ARCHAEOLOGICAL FIELD METHODS—Robert F. Heizer, Ed.—National Press, rev. ed., 85 p., illus., paper, \$2.00. A handbook compiled by a group of graduate students in the Department of Anthropology of the University of California.

A MANUAL OF CEREBRAL PALSY EQUIPMENT—National Society for Crippled Children and Adults, 140 p., illus., paper, \$3.75. Illustrations and explanations of equipment used to treat cerebral palsy.

METHODS OF TISSUE CULTURE—Raymond C. Parker—Hoebner, 2nd ed., 294 p., illus., \$7.50. A description of the major tissue culture procedures now in general use in many laboratories.

A MONOGRAPH OF THE EXISTING CRINOIDS, Vol. I: The Comatulids—Austin Hobart Clark—Gov't. Printing Office, U. S. Nat'l Museum Bull. 82, 383 p., illus., paper, \$2.25.

PHYSICAL GEOLOGY: A Laboratory Manual for Geology—Part I—Kirtley F. Mather, Chalmers J. Roy and Lincoln R. Thiesmeyer—Appleton-Century-Crofts, 87 p., illus., paper, \$2.75. To go with a one semester introductory physical geology course.

POCKET ENCYCLOPEDIA OF ATOMIC ENERGY—Frank Gaynor, Ed.—Philosophical Library, 204 p., \$7.50. A collection of brief explanations

and definitions of concepts and terms in the fields of nuclear physics and atomic energy.

PRACTICAL AND THEORETICAL ASPECTS OF PSYCHOANALYSIS—Lawrence S. Kubie—International Universities Press, 252 p., \$4.00. A revision and expansion of the book first published in 1936. It is a discussion of the role that psychoanalysis is playing in our world.

PRINCIPLES AND APPLICATIONS OF WAVEGUIDE TRANSMISSION—George C. Southworth—Van Nostrand, 689 p., illus., \$9.50. A text for advanced undergraduate students of physics or electrical engineering.

THE PRINCIPLES AND PRACTICES OF REHABILITATION—Henry H. Kessler and others—Lea & Febiger, 448 p., illus., \$9.00. Presents principles and practices of restoring the handicapped to the fullest physical, mental, social, vocational and economic usefulness of which he is capable.

PRINCIPLES OF INTERNAL MEDICINE—T. R. Harrison, Editor-in-Chief—Blakiston, 1590 p., illus., \$12.00. A new textbook.

THE PROSTATE GLAND—Herbert R. Kenyon—Random House, 194 p., \$2.95. A non-technical book about this male gland.

THE PSYCHOLOGY OF DICTATORSHIP: Based on an Examination of the Leaders of Nazi Germany—G. M. Gilbert—Ronald, 327 p., \$4.00. A study of leading personalities in the Nazi dictatorship in an attempt to determine the relationship between psychodynamics and social conflict in the modern world. (See SNL, Sept. 16, 1950, p. 182.)

THE PURSUIT OF PLenty: The Story of Man's Expanding Domain—A. G. Mezerik—Harper, 209 p., \$2.50. The abundance of natural resources and a blueprint for their attainment is presented.

RECONSTRUCTION IN PHILOSOPHY—John Dewey—New American Library, 168 p., paper, 35 cents. A mentor book originally published by Beacon Press. Some of Dewey's theories on experience and reason, the scientific factor and moral reconstruction are presented.

UNITED STATES CIVIL DEFENSE—National Security Resources Board—Gov't. Printing Office, 162 p., illus., paper, 25 cents. A plan for organizing the civil defense of this country. (See SNL, Sept. 30, 1950, p. 215.)

WHITE-FRINGED BEETLES AND HOW TO COMBAT THEM—H. C. Young and others—Gov't. Printing Office, U. S. Dept. of Ag. Circ. No. 850, 15 p., illus., paper, 10 cents.

Science News Letter, September 30, 1950

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⚙️ **DETACHABLE UPPERS** in various styles and colors are used with a single sole-heel section in a shoe just patented. Slots in the upper side of the sole, extending rearward from the cut-off toe, hold special edges of the uppers which are slid into them at the open front.

Science News Letter, September 30, 1950

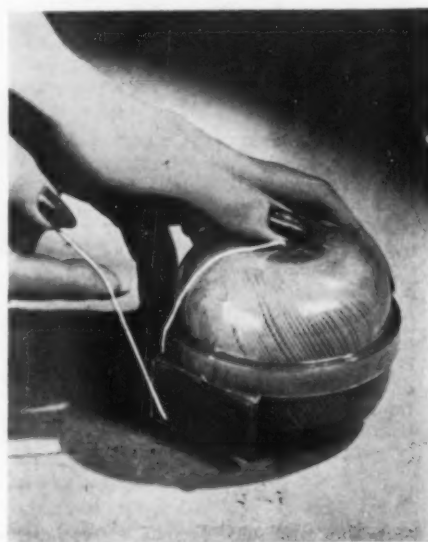
⚙️ **INDUCTION HEATER** to loosen tight-fitting fixtures on a power shaft such as pinions or gear wheels, is a small-size electrical device, rapid and effective because it distributes the heat evenly throughout the interior of the pinion. Little heat reaches the shaft to affect it.

Science News Letter, September 30, 1950

⚙️ **LIGHT CONCENTRATOR**, an improved light-weight lens and spring wire clip device, is quickly attached to an electric lamp bulb and gives a four-inch spot of illumination at a distance of 12 inches from the bulb. Its feature is the new type of lens used.

Science News Letter, September 30, 1950

⚙️ **TWINE HOLDER**, shown in the picture, is a plastic sphere molded in two halves which can be separated to insert the twine ball. Its feature is a razor blade



in a special holder on one side with a small portion of the blade exposed in a recess where the string is cut.

Science News Letter, September 30, 1950

⚙️ **COIN DETECTOR**, for use in offices receiving many letters containing nickels and dimes, is a machine which screens

opened mail to see that no coins have escaped the envelope openers. A coin-bearing envelope passing an electrostatic field in the machine is kicked aside.

Science News Letter, September 30, 1950

⚙️ **HYDRAULIC ARCH SUPPORT**, to be worn in the shoe, is an insole of two pieces of thin leather between which is a flat elastic bag containing a low-viscosity fluid. With each step, the pressure of the heel forces forward the fluid in the bag, making it take the shape of the arch and support it.

Science News Letter, September 30, 1950

⚙️ **STAMP COLLECTOR'S AID** with an attached magnifying glass can be used to measure sizes, count perforations and check watermarks. It is a compact plastic instrument with measuring scales under the lens, and a rotatable cylinder with different stamp perforation scales.

Science News Letter, September 30, 1950

⚙️ **CHILD'S DRESS** has built-in panties lined with a moisture-resistant plastic film. It is designed with snap fasteners down the front of the dress and along the sides of the panties so that it opens flat for simple dressing and undressing.

Science News Letter, September 30, 1950

Do You Know?

The average weight of *beef* animals when slaughtered is about 1,000 pounds.

Mayonnaise, for interstate shipment in the United States, must be 65% vegetable oil.

Eggs should be kept in the refrigerator; they lose freshness rapidly at room temperatures.

Bark from lumbering operations makes an excellent litter in poultry houses if reduced to a ground form.

Methylene chloride is used in some paint removers, being regarded as one of the most rapid solvents for paint, varnish and lacquer.

Sulfuric acid is often called the most important industrial acid; during 1949 over 10 million tons of it were produced in the United States.

It is estimated that over 41,000,000 household *electrical appliances*, from refrigerators to clocks to toasters and fans, will be sold in the United States during 1950.

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